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wherein a jacket material of the electrical conductive lead is composed of at least one selected from the group consisting of polyethylene resins, polyamide resins, vinylidene fluoride resins, chloroprene rubber, ethylene-propylene rubber, silicone resins, and fluoro resins, and the backing material contains any one of asphalt resins, vinyl chloride resins, polystyrene resins, and polyurethane resins, and

wherein the substrate is composed of at least one selected from the group consisting of metals, resins, and glass.

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### REMARKS

Reconsideration and withdrawal of the rejection set forth in the above-mentioned Official Action in view of the foregoing amendments and the following remarks are respectfully requested.

Claims 4 and 6-12 are pending in this application. Claims 4, 9, and 12 are the independent claims.

Independent Claims 4, 9, and 12 have been amended. The amendments to independent Claims 4, 9, and 12 merely improve their form and do not affect the scope of these claims. No new matter has been added.

Claims 4 and 6-12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,589,006 (Itoyama et al.) in view of U.S. Patent No. 5,470,657 (Hayami) and Applicants' Disclosure. This rejection is respectfully traversed.

In conventional building materials with solar cells affixed to backing materials thereof, electrical connectors are used to connect adjacent solar cells. In such conventional systems, vinyl chloride resins are used to insulate the conductive leads of the electrical

connectors and asphalt, vinyl chloride, polyurethane and polystyrene materials are used as backing materials. As the space between the solar cells and the backing materials is often narrow, and the connections must be run on the back sides of the solar cells, the electrical connectors, as well as the insulated electrical leads, often contact the backing material. Over time, chemical reactions take place between the insulating resin and the backing material resulting in breaches (i.e., cracks) in the integrity of the resin insulators. Such breaches allow moisture to enter the solar cell via capillary action. Moisture in the solar cell, in turn, results in electromigration which decreases the performance of the cell. For this reason, it is desirable to maintain the integrity of the jacket.

Independent Claim 4 recites features of a cladding assembly comprising a plurality of building materials each of which comprises a substrate and a solar cell unit fixed to the substrate on a backing material by a fixing member. In particular, independent Claim 4 recites, *inter alia*,:

. . . a jacket material of each of the electrical conductive leads is composed of at least one selected from the group consisting of polyethylene resins, polyamide resins, vinylidene fluoride resins, chloroprene rubber, ethylene-propylene rubber, silicone resins, and fluoro-resins; and the backing material contains any one of asphalt resins, vinyl chloride resins, polystyrene resins, and polyurethane resins . . .

Independent Claim 9 relates to a method of installing a building material and corresponds generally to independent Claim 4. Independent Claim 12, which relates to an air flowing apparatus, also recites similar features.

Through this combination of features, deterioration of the jacket due to the chemical reactions that take place over time when a jacketed electrical conductive lead is in contact the backing material can be prevented. Thus, the integrity of the jacket does not

deteriorate over time and moisture does not enter the solar cell through breaches in the jacket.

As a result, performance and durability of the solar cell are improved.

Applicants submit that the cited art fails to disclose or suggest at least the combination of the group of materials in the jacket material feature and the group of materials in the backing material feature recited in independent Claims 4, 9, and 12. As a result, the cited art fails to achieve the aforesaid advantages.

Itoyama, et al. relates to a solar cell module and a passive solar heating system using the solar cell module. However, as the Office Action notes, Itoyama, et al. does not disclose or suggest: (1) a jacket material composed of at least one selected from the group consisting of polyethylene resins, polyamide resins, vinylidene fluoride resins, chloroprene rubber, ethylene-propylene rubber, silicone resins, and fluoroelastomers, and (2) a backing material containing any one of asphalt resins, vinyl chloride resins, polystyrene resins, and polyurethane resins.

Recognizing this deficiency in Itoyama, et al., the Office Action cites Hayami and to the knowledge supposedly available to one skilled in the art at the time the invention was made to provide a suggestion of the claimed combination of the jacket material feature and the backing material feature.

The Hayami patent is directed to a heat resistant high voltage insulated lead wire for direct current and teaches an insulating layer comprising a polyolefin based resin formed over the conductor. The Office Action suggests that the claimed invention is obvious because Hayami supposedly teaches a polyethylene resin jacket and, regarding the absence in Itoyama, et al. of a teaching of the backing material feature, that it would have been obvious to one of

ordinary skill in the art to select the claimed backing materials from among available materials.

Applicants respectfully disagree with this suggestion.

Applicants respectfully submit that the cited art fails to teach or suggest the combination of the jacket material feature and the backing material feature recited in independent Claims 4, 9, and 12. Further, since the cited art does not even recognize the problems associated with the jacketed electrical leads and the backing materials of conventional building materials with solar cells fixed to substrates thereof, there is no suggestion to combine the cited art in the manner proposed by the Office.

Initially, Applicants note that MPEP § 2142 requires, to establish a prima facie case of obviousness, that:

references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references.

Indeed, a rejection for obviousness is improper when there is nothing in the cited references, either singly or in combination, to suggest the desirability of the claimed subject matter. In re Deminski, 230 USPQ 313 (Fed. Cir. 1986). See also, In re Jones, 21 USPQ2d 1941 (Fed. Cir. 1992) (before the PTO may combine the disclosures of two or more references in order to establish a prima facie case of obviousness, there must be some suggestion for doing so); In re Bond, 15 USPQ2d 1566, 1568 (Fed. Cir. 1990) (obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination). It is also well settled that when it is necessary to select elements of various teachings in order to form the claimed invention, there must be clear

suggestion of motivation in the prior art to make the selection. See Interconnect Planning Corp. v. Feil, 227 USPQ 543, 551 (Fed. Cir. 1985).

Applicants submit that there is no incentive, other than Applicants' disclosure, for combining the teachings of the prior art in the manner suggested in the Office Action. However, simply engaging in a hindsight reconstruction of the claimed invention, using Applicants' disclosure as a template and selecting elements from the citations, is an impermissible combination of the cited art. Interconnect Planning, 227 USPQ at 551. The references must provide some teaching whereby Applicants' combination would have been obvious. Applicants submit that such is not the case here. Rather, the Office has resorted to impermissible hindsight reconstruction in order to formulate the rejection under 35 U.S.C. §103. In re Deminski, 230 USPQ 313.

Here, neither Itoyama, et al. nor Hayami expressly or impliedly recognize that the durability of the jacket of an electrical conductive lead can be improved by using certain jacket materials and certain backing materials that do not chemically react when in contact. Thus, it is not surprising that neither of these patents expressly or impliedly suggest the claimed backing materials (asphalt resins, vinyl chloride resins, polystyrene resins, and polyurethane resins), in combination with the claimed jacket materials (polyethylene resins, polyamide resins, vinylidene fluoride resins, chloroprene rubber, ethylene-propylene rubber, silicone resins, and fluoro-resins). Therefore, to establish a prima facie case of obviousness, the Office must present a convincing line of reasoning supporting the position that it would be obvious to one of ordinary skill in the art to select the claimed backing materials for use with the claimed jacket materials. See MPEP §2142.

In support of the suggestion that the claimed invention would have been obvious to one of ordinary skill in the art, the Office Action merely states that, regarding the claimed jacket materials, "it is held to be within the skill of a worker in the art to select a known material as a matter of design choice to provide superior protection of the electrical lead" and, regarding the claimed backing materials, that "it is held to be within the general skill of a worker in the art to select a suitable material according to the given parameters, in this case a load bearing, water and heat resistant material for supporting the solar cell." (Office Action, pages 2-3). Absent is any line of reasoning that one of ordinary skill in the art, in the absence of Applicants' disclosure, would have combined Hiyama's insulator for a high-voltage direct current wire insulator of with passive solar heating system of Itoyama, et al. In short, there is nothing in the cited references, either singly or in combination, to suggest the desirability of the claimed subject matter. Therefore, the Office has not established a prima facie case of obviousness. See In re Deminski, 230 USPQ 313 (a rejection for obviousness is improper when there is nothing in the cited references, either singly or in combination, to suggest the desirability of the claimed subject matter).

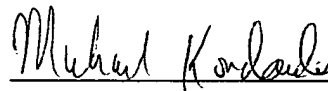
For the above reasons, Applicants submit that independent Claims 4, 9 and 12 are allowable over the cited art. The dependent claims depend from the independent claims and are believed allowable for the same reasons as the base claims and further due to the additional features that they recite.

This Amendment After Final Rejection is an earnest attempt to advance prosecution and reduce the number of issues, and is believed to place this application in condition for allowance. No new claims have been added. Furthermore, Applicant respectfully submits that a full appreciation of these amendments will not require undue time or effort given

the Examiner's familiarity with this application. Accordingly, entry of this Amendment under 37 C.F.R. § 1.116 is respectfully requested.

Applicants' undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,

A handwritten signature in cursive script, reading "Michael Kondoudis", is written over a horizontal line.

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## APPENDIX

### VERSION SHOWING CHANGES MADE TO THE CLAIMS

4. (Twice Amended) A cladding assembly comprising:

a plurality of building materials each of which comprises a substrate and a solar cell unit fixed to the substrate, each of the plurality of building materials fixed on a backing material by a fixing member; and

electrical conductive leads arranged between the building materials and the backing material to contact the backing material, for leading output from the solar cell units to the outside,

wherein a jacket material of each of the electrical conductive leads is composed of at least one selected from the group consisting of polyethylene resins, polyamide resins, vinylidene fluoride resins, chloroprene rubber, ethylene-propylene rubber, silicone resins, and fluoro-resins; and the backing material contains any one of asphalt resins, vinyl chloride resins, polystyrene resins, and polyurethane resins, and

wherein the substrate is composed of at least one selected from the group consisting of metals, resins and glass.

9. (Twice Amended) A method of installing a building material comprising the steps of:



fixing a plurality of building materials each comprising a substrate and a solar cell unit fixed to the substrate on a backing material by a fixing member; and

arranging an electrical conductive lead between the corresponding building material and the backing material to bring the electrical conductive lead into contact with the backing material, for leading output from each of the solar cell units to the outside;

wherein a jacket material of the electrical conductive lead is composed of at least one selected from the group consisting of polyethylene resins, polyamide resins, vinylidene fluoride resins, chloroprene rubber, ethylene-propylene rubber, silicone resins, and fluoroelastomers, and the backing material contains any one of asphalt resins, vinyl chloride resins, polystyrene resins, and polyurethane resins, and

wherein the substrate is composed of at least one selected from the group consisting of metals, resins, and glass.

12. (Twice Amended) An air flowing apparatus comprising:

a building material which comprises a substrate and a solar cell unit fixed to the substrate and which is fixed to a backing material with a space therebetween so that outside air flows in the space, passes through the space and is entrapped in a house or discharged to the outdoors; and

an electrical conductive lead arranged between the building material and the backing material to contact the backing material, for leading output from the solar cell unit to the outside,

wherein a jacket material of the electrical conductive lead is composed of at least one selected from the group consisting of polyethylene resins, polyamide resins, vinylidene fluoride resins, chloroprene rubber, ethylene-propylene rubber, silicone resins, and fluoro-resins, and the backing material contains any one of asphalt resins, vinyl chloride resins, polystyrene resins, and polyurethane resins, and

wherein the substrate is composed of at least one selected from the group consisting of metals, resins, and glass.

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